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ORIGINAL ARTICLES.

A RARE CASE OF BILATERAL OPTIC NEURITIS.

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Patient was a lady, 32 years of age. She is of middle size and fairly well nourished. Her general health has been good for the last decade or more. She has been married for 12 years and has three children. When she was pregnant the first or the second time (she cannot recollect the number definitely), her vision became impaired and remained so for some time. But it was not considered important enough to call a physician, and the vision returned spontaneously. Since then she enjoyed good sight until lately. The memory of this incident, of the patient as well as of her husband, is rather meager.

When seen for the first time, on the 7th of April, 1913, her vision of the right eye was reduced to hand movements. The left eye was absolutely blind. According to the history given, she did her household work and was able to read as usual on the 2nd of April. On the 3d and 4th she had some vague headache and some fever (?); and took some family medicine. When she woke up on the morning of the 5th she found that her left eye had become blind. The following day the vision of the right eye failed rapidly, and on the 7th was reduced to the state mentioned.

Examination.—Pupil of right eye ad maximum dilated. Very slight response to light. When the ophthalmoscope is used, the pupil contracts to a circle of 6-7 mm. diameter. Patient is able

to recognize the movements of the hand at a distance of about one foot; the perception is confined to the central portions of the field. Media transparent. The fundus was found normal, with the exception of a moderate dilatation of the retinal veins upon the optic disc.

The pupil of the left eye was likewise ad maximum dilated and was immobile. Even the ophthalmoscope did not provoke the slightest contraction. There was no perception of light. In the fundus of this eye the typical picture of neuritis optica was present. The disc infiltrated and swollen; the veins congested and tortuous. Yet the degree of the changes was a moderate one.

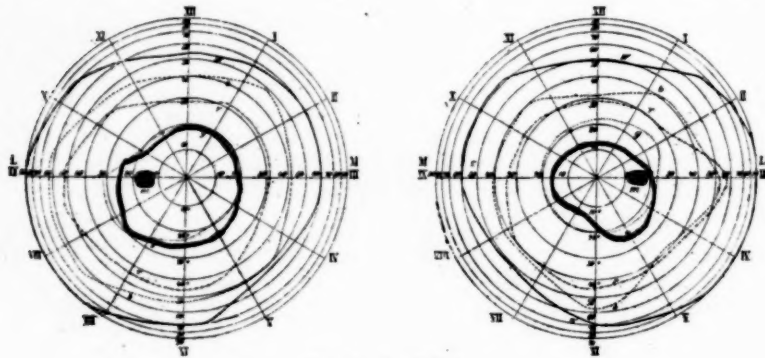


FIG. I. April 26th.

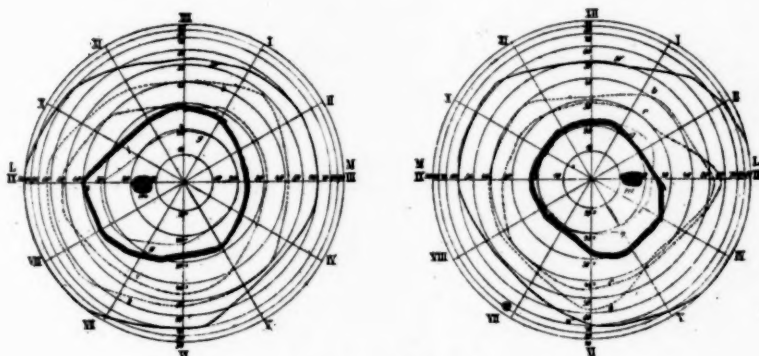
The temperature was normal; and there was never an elevation of temperature during the entire subsequent course of the affection. Patient had no more headache, or pain anywhere else. Only movements of the eyes to the extreme limit were accompanied by slight pain. The urine was free from albumen as well as from sugar. It was regularly examined hereafter with the same negative results.

The closest inquiry into the possible causal factors did not reveal anything. Heredity was denied. There was no local disease in the orbit or in the sinuses of the neighborhood. There was no acute febrile affection (the statement, that she had fever on the 3d and 4th, must be taken *cum grano salis*). Syphilis, diabetes, albuminuria, anæmia, chlorosis, could be excluded. There was no clue for poisoning by lead or any other substance. Intra-cranial symptoms were altogether wanting. The only pos-

sible factor discovered, pointed to the uterus. The menstruation was overdue one week. Therefore the possibility of an incipient pregnancy had to be taken into consideration.

The patient was immediately sent to a hospital. The treatment consisted mainly in rapid mercurialisation; and sweating, induced by pilocarpine injections and the internal use of the salicylates. Furthermore, Dr. S., obstetrician, was called into consultation. He took measures to bring forth the delayed menstruation, by hot douches, ergot, etc. The aspect of the case was so serious, that such measures were certainly justified.

The subsequent course was as follows: The general health was excellent. Patient had never any pain or headache, slept



well, enjoyed good appetite. In spite of the anything but pleasant condition and doubtful prognosis she was always cheerful and hopeful. The vision of the right eye decreased steadily and on the 10th this eye had also become entirely blind, and the reaction of the pupil to light was lost. Upon convergence there remained a slight contraction of both pupils during the full period of blindness. The intra-ocular symptoms of neuritis manifested themselves now in this eye, whilst the neuritis of the left had increased. Throughout the following week it continued to increase in both eyes. But the swelling of the discs never reached a high degree, such as we find it in choked disc. It was measured a number of times and the difference between the height of the swelling and the adjacent retina was never found to be more than $1\frac{1}{2}$ to 2 diopters; giving an elevation of about $\frac{2}{3}$ of a mm. Furthermore, the changes were confined mainly to

the disc; they did not reach far into the retina. With the exception of the immediate neighborhood of the disc, the retina was normal. It is evident that we had to deal with an inflammatory process of the optic nerve within the orbit, of which the terminal (intra-ocular) symptoms were not very marked.

On the 14th the menstruation commenced; there was a scant flow of blood. Orders had been given, to collect and preserve the discharge for closer examination. Unhappily the nurse forgot the order, and the soiled linen was thrown into the wash. For some days the menstrual flow continued, but it was never strong.

The complete bilateral blindness lasted until the 18th. On

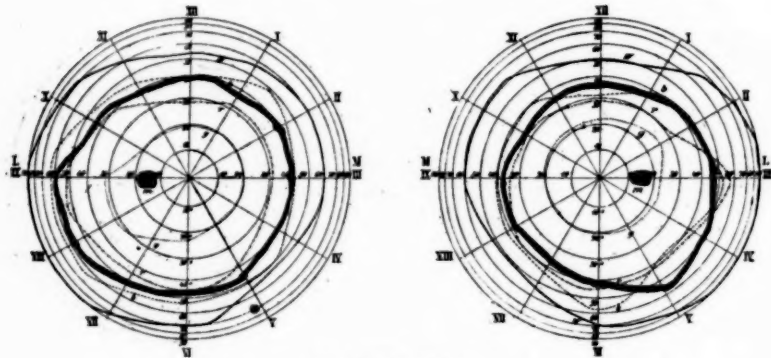


FIG. 3. May 12th.

this date the pupil of the left eye (the first affected) showed some response to light, when tested with the ophthalmoscope. Patient experienced then also a faint perception of light. On the 19th the pupil of the left eye responded better and that of the right eye showed also some reaction. From now on there was a slow but steady recovery of both eyes. The steady improvement of the central vision is best given by a copy of my notes:

- April 20. Perception of light in R.; hand movement in L.
- April 24. Both pupils smaller; reaction quite prompt.
- April 25. Leaves hospital.
- April 29. The swelling of the optic discs subsided gradually; and to-day there is nothing abnormal visible in the fundi, except a slight infiltrate around the veins of the disc. Vision=1/120, each eye.

May 3. Fundi may be pronounced normal. V. R.=6/120; L.=6/60.

May 5. R.=6/60; Snellen none. L.=6/24; Snellen VIII.

May 8. R.=6/24; Snellen X. L.=6/12; Snellen IV.

May 10. R.=6/15; Snellen IV. L.=6/12; Snellen II.

May 12. L.=6/12; Snellen III. L.=6/9; Snellen I with difficulty.

May 15. R.=6/9; Snellen II. L.=6/7; Snellen I.

May 24. R.=6/7; Snellen I w. d. L.=6/6; Snellen I.

Dismissed.

There was never a central scotoma. On the contrary, the fibres of the macular bundle were the first ones to recover; the

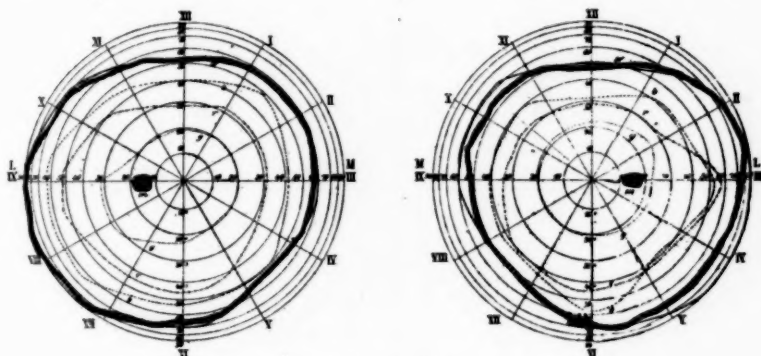


FIG. 4. May 24th.

central vision was always by far the best. The field of vision was at first very small, but concentrically contracted; it increased slowly and in the same ratio as the central vision; as shown by the accompanying charts.

The color perception was very poor for some weeks after the vision had commenced to improve. It affected all colors uniformly. In the beginning of May no color could be recognized; all looked alike to the patient. Differences of brightness were distinguished first. By and by the main colors, red, blue, green, yellow, could be made out; and apparently their recognition came at about the same time. There was certainly no red-green blindness. These two colors could be distinguished from each other as soon as any other.

As seen from the data, the right eye had been entirely blind for 13 days and the left eye for 10 days. I am unable to find in

literature a case where blindness due to optic neuritis lasted that long and where restoration of vision took place; for this reason I considered the case worthy of publication.

In my opinion we had to deal with an inflammatory process, which involved more or less the entire optic nerve. It certainly began as a "retro-bulbar" neuritis; this term being used here in its correct sense. Unhappily the nomenclature of diseases of the optic nerve leaves much to be desired; especially, since the term retro-bulbar neuritis had been introduced to designate the toxic amblyopias. It ought to be restricted to really inflammatory diseases and not to atrophies produced by poisons.

As to the cause of this severe neuritis, I still believe that the condition of the uterus was more or less responsible. Conclusion *a posteriori*, because improvement of vision set in, after the menstrual flow had commenced, seems to strengthen this assumption. The question, whether we had to deal with delayed menstruation, or with incipient pregnancy, must remain an open one, as the material, on the basis of which this question may have been decided, had disappeared. Without such positive proof Dr. S. did not want to decide the question one way or another.

A NEW METHOD OF DELIVERING THE LENS IN ITS CAPSULE.*

BY A. E. EWING, M.D.,
ST. LOUIS, MO.

In removing a piece of the anterior capsule of the lens with the capsule forceps, one now and then happens on an intra-capsular extraction, probably because of a tough capsule and a weak zonule. Also, one blade of the forceps may slip back of the lens margin. Such an instance was mentioned in an article entitled "Mandible Forceps" (*Am. Journal of Ophthalmology*, May, 1913,) in which the healing was rapid, the pupil was clear and the visual result was normal. This lack of iritic irritation and this prompt healing of the corneal wound accords with the usual experience in cases in which the lens is removed in its

*Read before the St. Louis Ophthalmological Society, Nov. 24, 1913.

capsule, as well as in cases in which the capsule has been ruptured and the cortex has been thoroughly removed, and is the strongest evidence that the ideal method of extraction would be the intra-capsular, as it would eliminate the risk attending swelling cortex, as well as that connected with secondary membranes, provided it may be accomplished without injury to the adjoining vitreous, and without too greatly disturbing the attachment of the suspensory ligament in the ciliary region. Unquestionably Daviel extracted many lenses in their capsules, and from then until now the methods of accomplishing this result have had earnest advocates; yet no method has been devised that is so free from danger as to cause its universal acceptance by the safer and more conservative practitioners, a large majority of whom do not even attempt it because of the great risk.

Of the three methods now ordinarily employed, the one usually resorted to is that by expression, in which, following the corneal section, and the iridectomy, the lens within its capsule is forced from the eye by external pressure applied near the corneal margin opposite to the corneal incision. A modification of this method is to catch the lens capsule with forceps, rotate the lens on its antero-posterior axis, and then remove it by expression. Another modification is to pass a hook down in front of the lens, rupture the zonule at the lower border, remove the hook and extract by pressure.

The second method is to pass a cataract spoon or a loop behind the lens and remove the lens in its capsule by gentle traction. Often the procedure is aided by pressure on the cornea.

The third method, recently suggested by Hulen, is to place a suction instrument on the capsule in the pupillary area, exhaust the air and remove the lens by traction, or by traction and expression.

Possibly other reasonably safe methods by traction, or by traction combined with expression, may be executed by employing the following described instruments, the common form for the handle of which is shown in Fig. 1, A. The base consists of a forceps handle, to which two shafts, *a* and *b*, are attached, one to each limb of the forceps. These shafts connect at the end of the handle by two cogwheels, *c*, so arranged that when one of the shafts is rotated the other will rotate in the opposite direction. Attached to one of the shafts is an adjustable spring, *d*, and in a convenient position also a small short arm, *e*, which is

controlled by the forefinger. To prevent the forceps opening wider than is necessary a small stop, *f*, is provided.

The points for the rotating shafts may consist of loops, spoons, fenestrated spoons or hooks. By means of the rotating shafts and the finger control, any of these different forms of points may be made to assume any of the principal positions represented by 1, 2 and 3 in diagrams B, C and D in the accompanying illus-

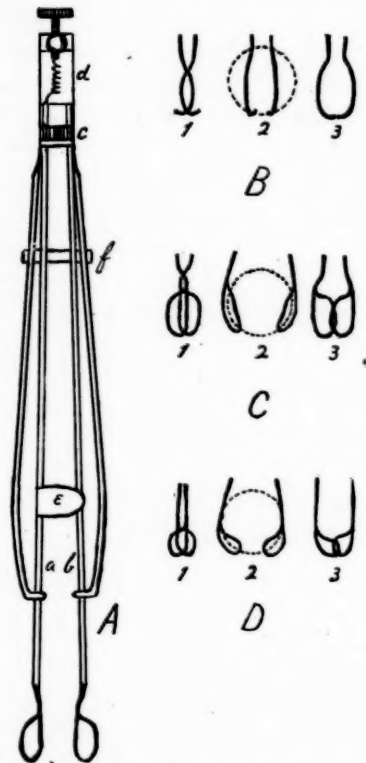


Fig. 1. A new method of delivering the lens in its capsule. Illustrations of instruments that may be employed.

tration, Fig. 1, as well as all intermediate positions. The spring adjustment aids in rotating the tips to any desired position and retaining them in this position until it is changed by the direction of the forefinger. In the case of the hooks, they are first adjusted by means of the spring, so they will set to hook the lens at its lower margin. With the forefinger on the arm *e*, they are turned sidewise, in which position, with the forceps closed, they

are introduced between the iris and the lens to the lower lens margin. The finger then releases the arm *c* and the hooks are brought into the desired position to grasp and withdraw the lens, while the thumb and middle finger on the limbs of the forceps separate the hooks to any desired distance. When the lens has presented itself beyond its equator in the wound, the hooks may be returned to their sidewise position by the forefinger, so as to do no injury to the vitreous, or to the margins of the corneal wound, or to the iris. This is the ideal. Practically I find that the hooks hang and cause trouble when employed on the eyes of animals. I have not tried them on the human lens.

The loops are managed in a similar manner to that of the hooks. Each loop is constructed with a shoulder, the purpose of which is to pass backward around the edge of the lens when the spring is released. The forceps are then closed; by gentle traction the lens is dislocated and coaxed into the corneal wound, and when it is half way through the wound the loops may be returned by the forefinger to the first or third position, preferably the first, in order to avoid rupturing the vitreous.

Judging from trials on the eyes of animals, this seems to be a practical instrument, and employed in this way the method seems to be practical. Also the instrument works well in the half or the one-third size, possibly better than in the full size. In this smaller size it grasps the lens at its lower border on either side, and the shoulder of the loop does not interfere as the lens starts on its passage through the wound, as may occur with the larger size.

These instruments are also applicable in cases in which the lens has been dislocated into the vitreous.

TRANSLATIONS.

DOES THE CORNEA NOT PARTICIPATE IN THE ABSORPTION OF THE AQUÆOUS HUMOR.*

BY DR. C. HAMBURGER,
BERLIN.

(Translated by Adolf Alt, M.D.)

During the discussion on von Szily's paper at this year's Heidelberg Ophthalmological Congress I showed a microscopical specimen in which Descemet's membrane, at least the nuclei of its endothelial cells, were stained blue *intra vitam*. The staining resulted from an injection of sodium indigo-sulphate into the auricular vein of a living rabbit. The enucleation of the absolutely untouched and absolutely healthy eyeball was made about a quarter of an hour after the injection. Not a trace of blue was found in any other part of the eyeball.

An observer, well versed in microscopical technique, said that he had never seen this extraordinary selective staining of Descemet's membrane *intra vitam*, and in the references to my demonstration a slight doubt always was expressed.

If this was an affair of little interest, it might be just as well to say nothing further about it. We have, however, to deal with an important question in the physiology of nutrition of the eye; for a staining material which, when introduced into the blood, is already after so short a time stored in Descemet's membrane of the untouched eye, can have come there probably only by way of absorption after having by secretion been mixed with the aqueous humor in a minute quantity. To my thinking this procedure proves that the cornea, also, is an organ of absorption; and this observation, if it is correct, is of no inconsiderable importance because it is opposed to the common opinion expressed in every textbook on physiology, according to which the cornea has nothing whatever to do with absorption.

Yet, the observation is *correct*. I cannot only state that this specimen, which I stained in Hertwig's laboratory, was demon-

*Klin. Mtsbl. f. Augenhk., September, 1913.

strated at Heidelberg and was examined by experts at Berlin; but in order to exclude all misunderstanding I want now to make known the exact manner in which I obtained it. The illustration can be found in the report of the Congress (and perhaps in a comprehensive work on the present knowledge of the nutrition of the eye which I hope to be able to publish in about a half a year).

(1) Whoever wants to see how easily a 2 per cent. solution of sodium indigo-sulphate penetrates into the cornea, iris and the nuclei of Descemet's endothelium, needs but to introduce a small quantity of it into the anterior chamber. A half or three quarters of an hour later the eye is enucleated and put into absolute alcohol, or, what is more preferable, right after death absolute alcohol is brought into the eye by means of injection from the heart. (cf. Hamburger, *Klin. Mtsbl.*, 1910, p. 60. The shrinking of the tissues is more certainly prevented by injection from the heart.)

(2) The staining of the inner surface of the cornea is much more brilliant by way of the bloodstream. A large rabbit weighing about three kilograms has forty to fifty ccm. of the 2 per cent solution within half an hour slowly infused into the femoral vein. Small animals are not appropriate because they bear in proportion much smaller quantities only, and die not uncommonly in spasm just after completion of the successful injection. After this, Descemet's membrane is found to be plainly blue. However the bloodvessels of the iris, also, are well stained and those of the ciliary body slightly according to the regions where the staining material was secreted, for it has a great affinity to the bloodvessel walls. When smaller quantities are injected besides the membrane of Descemet, as is well known, only the walls of the iris bloodvessels and not those of the ciliary body show any blue tint.

(3) The most brilliant way, however, is to work with minimal quantities of the staining material, so that neither iris nor ciliary body shows any blue parts while the posterior surface of the cornea alone is colored. Such an isolated staining was obtained by injecting 1.5 ccm. of the 2 per cent. solution into the auricular vein of a small animal weighing only 340 grammes. The eye was enucleated about one quarter of an hour later. The lens of this young rabbit in spite of being embedded in paraffin was so soft that its peripheral parts, at least, could be cut into sections.

All experiments on the eye with sodium indigo-sulphate are somewhat uncertain, even when all precepts as to quantity are observed in the strictest manner. (Ernst V. von Knappe, in the *Scandinavian Archives for Physiology*, 1911, XXIV, p. 259 to 320, who repeated my experiments, makes this statement, too, using almost my own words. However, Knappe does not seem to have made any studies of the staining of the endothelium of Descemet's membrane.) The experiments mentioned under (1) are easily the most successful; those under (2) miscarry now and then; those under (3) are very delicate and are of the most difficult experiments to perform that I know of. I shall very gladly show doubters the specimens I possess.

Trypan-blue can, also, be used to produce from the blood an intra-vitam staining of the posterior surface of the cornea, but this is not isolated; the lens capsule is, also, stained blue, most intensively at its æquator.

Ulrich reported a similar result in his, as it seems to me, altogether too little valued papers "On the nutrition of the eye" (*von Graefe's Arch. f. O.*, 1880, Vol. XXVI). This was obtained by the subcutaneous injection of ferrocyanate of potassium and fixation of the eyeball enucleated four hours later in alcohol containing ferric chloride.

Isolated staining of Descemet's membrane from the blood, showing an absorption by the cornea, can be successfully produced only with indigo-sulphate of sodium, at least, as far as I know.

SARCOMA OF THE UVEAL TRACT,

INCLUDING THE EXPERIMENTAL RESEARCH CONCERNING TUMORS
AND THE MODERN VIEWS ABOUT THE HISTOGENESIS
OF TUMORS.*

BY DR. O. LANGE.

(Translated by Adolf Alt, M.D.)

On January 3d, 1907, I was consulted by a 57 year old woman on account of her right eye, which had been injured 9 years previously while threshing, suffered from *ulcus serpens*

*Klin. Mtsbl. fuer Augenhk., October-November, 1913, p. 537.

and become phthisical. Until 1902 the blind eye had caused no suffering. In November, 1902, without known cause, the blind eye became painful, but the irritation disappeared soon and the eye remained quiet till 1906. In August, 1906, the patient saw on the surface of the still painless eye a black spot, which grew rapidly and bled easily. Then the eye became again painful. By November the black spot had grown greatly and protruded as a black, easily bleeding tissue mass between the lids; the pains grew more and more severe, till they became unbearable. Patient says that she lost flesh rapidly during the last six months and feels very miserable.

The examination of the very badly looking, emaciated woman showed a tumor which had perforated the temporal corneoscleral margin, was the size of a plum, pigmented, covered with crusts and bleeding. This could only be looked upon as a sarcoma. From the general protrusion and the lack of motility in all directions, I had to conclude that the intraocular tumor had perforated the eye backwards into the orbit, also. Since the examination of the internal organs did not show any metastases—the liver was not enlarged and was smooth, no cough, urine normal, indican not increased, no black sediment after prolonged standing in the light—I decided to make a subperiosteal exenteration of the orbit, having told the family of the meagre chances of a lasting cure.

On January 9th I performed the operation, and found the optic nerve perfectly black back to the foramen opticum osseum, so that I could not operate in healthy tissue but had to leave black tumor masses in the depth of the orbit, which I tried to destroy with the Paquelin. Under these circumstances I expected to see a local recurrence in a very short time. Instead, the large wound surface healed without any accident and the patient could be discharged in very good condition on February 15th. I kept a watch on her and was not a little astonished and pleased when I heard from her again and again, that she was doing well. When I saw her in December, 1911, about 4 years after the operation, she was apparently perfectly healthy and had no complaints. Her weight had increased considerably, her color was good and she could do all her work.

On May 14th of this year, that is 6 years and 4 months after the operation, I have seen her again. She stated unasked that she was perfectly well, except that she had lost flesh within the

last year. The orbit shows a firm white scar with nothing suspicious of a tumor. The internal organs are in a normal state, urea without albumen or sugar, no headache. She does all her work. The other eye is perfectly normal.

It is not exactly wonderful that $6\frac{1}{2}$ years after this absolutely incomplete operation no metastasis have shown themselves in the inner organs, since they often appear only after 8, 10, 15 years and more. However, it surely does not happen frequently, as in my case, that although plainly visible, black tumor masses were left in the orbit no local recurrence had formed after $6\frac{1}{2}$ years. On page 273 of his well-known book on the sarcoma of the uveal tract, Fuchs says: "Regarding the prognosis we have to deduct 8 cases (among 243 cases) in which the operation was incomplete or not done at all." He thinks, then, that as a matter of course a local recurrence must occur after an incomplete operation. In his tables, which include completely operated cases only, the local recurrences came on most frequently within 6 months, but sometimes much earlier, even within one week after a complete operation. A few weeks after the case just related, I had to exenterate the orbit in another individual in whom a local recurrence happened only 11 days after, although I felt confident I had removed everything.

In the case described above the conditions were apparently extraordinarily favorable for a rapid local recurrence, since, as the microscopical examination showed, we had to do with a very vascular, darkly pigmented, large cell spindle-cell sarcoma, partly alveolar, which I was forced to remove but incompletely. Yet, there was not a trace of a recurrence $6\frac{1}{2}$ years later. It will be difficult to explain this satisfactorily, although based on the microscopical findings we were convinced that larger parts of the retrobulbar tumor, especially, showed signs of necrosis on account of the excessive pigment formation in the cells which appeared as totally black, non-transparent round bodies, while a great deal of pigment lay free in the tissue. The largest part of the tumor consisted of large, more or less pigmented spindle cells, without signs of necrosis. This was the case, also, with the parts lying at the apex of the orbit and having invaded the posterior parts of the optic nerve. I do not think it possible that with the Paquelin I destroyed all the pathological tissue in the depth of the orbit and in the optic canal. I, therefore, note the fact of the local non-recurrence after $6\frac{1}{2}$ years of a sarcoma

of the uveal tract in the third stage which I had removed incompletely.

Wintersteiner, to whom I wrote about this observation, answered me that no such case was to be found in literature, but that he himself had had a similar experience:

"Enucleation on account of atrophía dolorosa. At the microscopical examination I found a sarcoma of the choroid which had already perforated the sclera posteriorly. In the microscopical sections it is plainly seen that the retrobulbar nodules were cut by the scissors, therefore part of them was left behind. In spite of this no local relapse. Death occurred thirteen years later from phlegmone of the larynx. Enormous metastases in the liver, one as large as a hen's egg in the meninges of the frontal lobe. Contents of the orbit free from tumor, microscopically, too."

Wintersteiner could explain his observation as little as I could mine. P. Kerschbaumer, in her book (*Sarcoma of the Eye*, p. 298) reports an oral communication of H. Sattler, according to which he found in an enucleated phthisical eyeball a sarcoma which had perforated the sclera backwards and immediately performed exenteration of the orbit. For seven years no local relapse appeared. Then von Schroeder reported the following case from the St. Petersburg Eye Clinic (reviewed in the *Centrbl. f. Aughkl.*, 1892, p. 285):

"Woman, 28 years old, with sarcoma of the right eye. T+3; V=0. On March 14th, 1891, enucleation. The tumor had perforated the sclera backwards, had grown upwards along the optic nerve and formed numerous disseminated nodules in the orbital tissue. These were removed with knife and scissors, as completely as possible; however, the examination with the finger showed that numerous minute tumors were left behind. The nerve, also, could be felt in the depth as a hard tumor-like mass. Dissection of the globe showed a large melanotic tumor of the choroid. Expecting an early local relapse the orbital cavity was powdered over a number of times during the following two weeks with pure blue pyoktanin. The wound healed with a clean scar in two weeks and the general condition improved. No local relapse a year later."

Von Schroeder is inclined to ascribe the favorable result to the pyoktanin and recommends its use in similar cases. In his book, page 275, Fuchs mentions a case in which at the time of

the operation the primary tumor protruded out of the eye like a plum. Two years later two little tumors were removed from the orbit and three years later again a small nodule. Three years after this no further local relapse had occurred. In the *St. Petersburg Medical Weekly*, I have reported (1881, p. 335) two cases of primary pigmented fibrosarcoma of the orbit, which I had removed as well as possible without sacrificing the eye (Kroenlein was not known then). Although in both cases parts of tumor undoubtedly remained in the orbit, local recurrences did not appear for several years after. Similar observations were recorded by Walther and Stoeber. In the February number of 1894 of this paper, I again discussed these orbital cases prompted by Berlin's doubt of the correctness of my diagnoses, and added accurate drawings of the specimens made with Winkel's drawing prism.

In contrast to this peculiar, but rarely observed and with difficulty explainable, behavior of a choroidal sarcoma in the third stage, I want to refer to the fact that, as is not rarely seen, small and smallest sarcomata absolutely confined to the choroid in spite of the earliest and apparently most radical removal by enucleation, will soon after the operation cause death by metastases in the inner organs. Such a case, which I shall never forget, I saw during my service at the St. Petersburg Eye Clinic with my chief, Dr. Magawly:

The patient was a lady, in the twenties, in whose left eye near the macula lutea a small grayish tumor mass was found, which was about $1\frac{1}{2}$ disc diameters, large and protruded into the vitreous body for about $1\frac{1}{2}$ mm. There was a corresponding central scotoma in an otherwise free visual field and an eye absolutely free from irritation. Magawly and I, who had seen the case separately, agreed that it could be nothing but a small pigmented choroidal sarcoma. Hardly a year after the enucleation the patient died from sarcoma of the liver.

The dissection of the eye proved our diagnosis correct, but a microscopical examination could not be made since the eyeball in an unaccountable manner disappeared.

A second similar case I have seen here in Brunswick in an enormously strong and healthy looking man, 32 years old, in whose left eye I had diagnosed a choroidal tumor about 4 mm. long, about .5 mm. broad and about .3 mm. high. Dissection of the enucleated eyeball proved the diagnosis correct and the mi-

croscope showed a lightly pigmented alveolar sarcoma. Although the tumor was apparently completely removed, since, as the microscope showed, it had nowhere grown beyond the choroid, the patient died about 9 months later from a metastasis in the brain.

On page 277 l.c., Fuchs says that metastases appear almost always within the same period of time, whether the tumor was removed early or late. In F. Baudouin's dissertation "*Du sarcoma mélanique du tract uveal*," Paris, 1897, L. Championnière's opinion is given, which he expressed in discussing the prognosis:

"Operate as soon as you please; the result is always fatal." He sees in the melanosa sarcoma of the uveal tract a thing to be left untouched, and says further on: "I have also noticed that whip-like the operation seemed to arouse the disease and provoke a quick relapse. I am for keeping as far as possible away from a radical intervention in melanosa sarcoma."

On page 488 of Vol. II, *Traité complet d'ophtalmologie* of de Wecker and Landolt (1886) we read: "It is probable that if we could more often observe a choroidal melanosa sarcoma from its beginning, we should become convinced that its course, like that of a general melanosis, is extremely slow. Thus I have seen melanotic tumors of the sclerotic which have remained absolutely stationary for 20 years. In the same manner, with the choroidal sarcoma, I have been able to definitely prove that the beginning of the tumor dated back for six or eight years from the time the patient came under observation."

Fuchs relates a case of Stoeber's in which the tumor had existed for 17 years before the operation, and the patient remained healthy for 10 years after it.

If we consider, on the one hand, the experience made by myself and by others, that not infrequently after an apparently radical removal of a very small choroidal sarcoma by enucleation, metastases occur strangely soon after the operation, and that, on the other hand, choroidal sarcomata left to themselves are borne very often for a long time without damage to the inner organs, I must confess that I have often put the question to myself whether we really benefit the patient when we remove by enucleation a small, probably very slow-growing intraocular tumor, which causes little visual disturbance and no pain. And yet, when the diagnosis of tumor is made, hardly any physician will decide to keep a waiting attitude. The fact that post-operative local relapses in comparison with the often very slow

growth of the primary tumor, spring up and grow with astonishing rapidity, also gives food for thought.

Let us recapitulate what Ehrlich and his pupils have proven when making experimental tumor studies on mice and rats.

Ehrlich says: "I believe that misplaced tissue germs play a very large rôle in tumor ætiology, but by themselves are by far not sufficient to produce a newformation; in my opinion there must be added a second and most important factor, that is, the reduction of the normal character of atrepsia." Atrepsia means the absence of a certain material which is absolutely necessary for any tumor development. The germs, according to Ehrlich, are very frequent but remain latent on account of this defensive arrangement of the organism. He says further: "That, aside from this atreptic immunity, there is also an active immunity is proven by the following experiment. If rats which had once been successfully inoculated are after the proper time again inoculated with the same tumor (primary mouse carcinoma), the result is at first negative. The lack of success from this second inoculation can be due only to an active immunity, that is to the formation of antibodies, provoked by the absorption of the tumor tissue." And further on: "If we imitate the formation of metastases experimentally, that is by again inoculating animals, which previously had been successfully inoculated with a quickly growing mouse tumor, after eight or ten days with the same or another tumor, the second inoculation with few exceptions will be without success. The easiest explanation of this fact is that the first, very vascular tumor, during its giant growth taking its nourishment, so to speak, with a thousand mouths withdraws from the blood the substances necessary for its growth so completely that for the second tumor inoculated under such unfavorable circumstances, as well as, for embolically disseminated tumor cells, not sufficient of the material for their further growth is left. The slower a tumor grows, the less nourishing substances does it need to assimilate, the less favorable, therefore, are the conditions for the growth of secondarily inoculated or embolically disseminated cells."

On the genesis of carcinoma Ehrlich again states that in mice with a large quickly growing tumor a second inoculation generally does not take or at least only very slowly, and that the percentage of metastases is relatively much higher with slow-growing spontaneous tumors than with quick-growing inoculated tumors.

Apolant says: "A reduction of the virulence of the tumor cells is possible (a) through a direct damage to the tumor cells, as for instance by cold; the tumor then grows avascularly and soon becomes necrotic; (b) by increasing the resistance of the host when by repeated previous inoculations the animal has been partly immunized against this tumor."

Von Dungern states: (1) The malignity of the so-called malignant tumors must be sought for in the malignant cells themselves. (2) There is no longer any doubt, that experimentally animals can by previous treatment be made secure against a malignant tumor transplantation, and, as Ehrlich has found, this immunity which results from the absorption of tumor cells is not a specific one."

Previous treatment with carcinomatous material guards not only against transplanted carcinoma tissue, but, also, against sarcoma, and *vice-versa*. Ehrlich calls this interesting, again and again found conditions, the pan-immunity. Whether we can immunize against autochthonous tumors, and whether the tissue of the body can render itself resistant against tumor cells, are still unsettled questions. According to von Dungern and others (Bashford, Uhlenhut) the tumor immunity consists of reactions of the organism which damage the tumor cells.

Von Uhlenhut, Haendel and Steffenhagen have observed a so-called operation immunity. Animals radically operated on without relapse proved to be immune; incompletely operated ones in which a relapse occurred were sensitive on later tumor inoculation. The well-known fact that post-operative relapses grow rapidly and that, as proven by Clunet's experiments, after the removal of a tumor metastases are observed much more frequently than without operation, is in a certain antagonism to operation immunity.

Von Dungen, Clowas, Gaylor and Baesluk, Gay and Lewin have succeeded in immunizing other animals with serum taken from immunized ones.

According to Haendel and Schoenburg the fact is demonstrated that the relapse-free operation of sufficiently developed tumors is followed by a strongly pronounced immunity; that, however, a relapse-free operation of young tumors is not followed by immunity when the individual is later inoculated with its own or a foreign tumor. If tumor tissue is left behind in the operation, and if a local recurrence is observed, the immunity does not result.

Apolant says: "Years ago Ehrlich developed the idea that altered nutritive conditions in the organism are the deciding factor for the spontaneous development of a tumor. All tumors show the peculiarity that their cells compared with the corresponding normal cells show an increased proliferation energy." Ehrlich, and, independently from him, E. Albrecht, explains this difference of normal and tumor cells by their different avidity toward nourishing material and believes that between the tumor cells and the corresponding body cells a disturbance has occurred in the avidity conditions in favor of the former. Two things are possible: either the avidity of the tumor cells is increased or that of the body cells is diminished. Ehrlich supports the latter view because the results of transplantation of the spontaneous tumor are in general unfavorable. This opinion agrees, also, with the long adopted tendency to tumor formation, and with the fact that tumors develop with predilection later in life. Bashford, Murray and Cramer have shown that extirpated spontaneous tumors can usually with success be inoculated into their host, while in normal animals they grow rarely, which was, also, experimentally demonstrated by Apolant. When a spontaneous tumor is inoculated into another animal with a spontaneous tumor, there seems to exist a considerable disposition of the animal with a spontaneous tumor. Apolant relates very interesting observations made by Ehrlich. As previously stated, in a mouse, the host of a quickly growing spontaneous tumor, inoculations do not take or grow slowly. If, however, the inoculated tumor is considerably more virulent than the first one, it does not only take but retards very materially the growth of the first tumor. Ehrlich's explanation is that the more virulent second tumor withdraws the nutritive material necessary for the growth of the first tumor and thus reduces its further growth.

In order to provoke this atresia the second tumor must possess a maximal virulency, this is, however, not due alone to a specially high growing force, but also to the faculty of intensely attracting the nutrient material. Ehrlich calls this *exhaustio* or *areptio*.

If we confine ourselves to these few but undoubtedly proven results of animal experiments, it seems to me that, although similar experiments in man have been made in very few instances (von Leyden and Blumenthal), and do not permit of undoubted conclusions, we can, without transferring the results of the ani-

mal experiments directly to man, take note of them in judging our clinical experiences in man. This, as far as I know has thus far not been done at all. The facts proven by animal experiments and the deductions made from them can at least help us to understand the clinical experience, which thus far was impossible, and perhaps, to explain them in an acceptable way on a scientific basis. E. F. Bashford, in a lecture on the cancer problem, says that the value of experimentally produced growth resistance lies in its giving us an insight into the nature of tumors, into the biology of tumor cells and their relation to the organism, without at present being of especial value for our therapeutic endeavors. "All processes of immunity are useless against spontaneous tumors and in the host immunizing procedures have no effect." He finishes the paper by saying: "We must strive to attack the tumor cells themselves, as has been tried by von Wassermann, Neuberg and Caspari."

Let us return from these studies to my case above detailed. It does not seem unpermissible to compare the highly peculiar and thus far complete freedom from any relapse of our patient, in spite of a decidedly incomplete removal of the very large tumor, with the fact which Ehrlich recognized from his experiment that with rapidly growing necrosing inoculation tumors metastases are comparatively rare, and that the absorption of tumor masses causes the formation of antibodies and thus an active acquired immunity.

I am inclined in my own and the other cases above referred to, to assume an active immunity from the absorption of necrosed tumor-cells, which has thus far saved the organism from the appearance of local relapses as well as from metastases. Of course, I cannot prove the correctness of this assumption, yet it seems to me to be permissible; in every case, however, it may give an explanation based on experiments of the otherwise incomprehensible course of these cases. That such cases like mine are observed much more frequently, I believe at present on purely theoretical grounds to be the case on account of the usually relatively early operative removal of the melanotic sarcoma of the choroid, at a time when neither by the absorption of necrosed tumor cells an active immunity nor an atreptic immunity in the sense of Ehrlich has been developed on account of the insufficient size and the slow growth of the tumor.

On the other hand, the observation made by myself and many others, that not infrequently after the removal of small and smallest, apparently slow growing sarcomata of the choroid metastases develop rapidly in inner organs, may find its analogon in the fact, experimentally proven, that with slow growing spontaneous mouse tumors in consequence of an insufficient atreptic immunity, the percentage of metastases is strangely high. Clunet's opinion based on animal experiments, that after the operation of a tumor metastases are much more frequent than without operation, if correct, would support the opinion of Championnière, above mentioned, that melanosarcoma of the uveal tract is a touch me not. I, for my part, am inclined to agree with Championnière as long as the tumor is still very small.

In the May number of this Journal, von Hoor, under "The malignity of the pigmented tumors of the eye," reports a case which seems to speak for this view. Von Hoor's conclusion deducted from this case, that even the smallest *nævus pigmentosus* should be removed as soon as seen, I cannot accept. Based on my experience I should rather believe that a waiting attitude is the best in these cases. I am convinced that the 15 year old patient of von Hoor, who before the operation looked blooming, would not have died in six months if the operation had not been made.

At present, on theoretical grounds, we should proceed with operative interference in melanoses of the eye only after we are convinced of a well established autoimmunity or a passive immunity brought about by us in the organism which is suffering from a spontaneous tumor.

I may, here, be permitted to say something of the histological side of the study of melanoses of the eye.

Through the kindness of Fuchs, Wintersteiner, Schultz-Zehden, Purtscher, Silex and Wolfrum, I have been able to study their specimens of accidentally found initial sarcomata of the uveal tract. From these specimens it is certain: (a) that sarcoma of the choroid begins in the layer of the larger and medium sized blood vessels of the choroid; (b) that it spreads laterally between the lamellæ of the suprachoroid, i.e., the most external layers, and (c) that the chorio-capillary layer is not always free from sarcoma cells, as is shown especially in Wintersteiner's specimen. The question of the origin of the sarcoma cells which are plainly differentiated from the other cells in these

smaller tumors (of about $1\frac{1}{2}$ mm. diameter and about 0.3 mm. height), whether from the physiological chromatophores of the choroid, whether from the adventitia of the bloodvessels, whether from the endothelia of the elastic lamellæ, can in my opinion even with the strongest immersion lenses not be decided with certainty by microscopical examination. Even in the earliest stages of tumor formation there is already a finished, characteristic tumor tissue which, as Ribbert rightly says, at all times of its existence is connected with the surrounding tissue locally, never genetically, and, therefore, forms an independent entity. I think from the study of the specimens of initial choroidal sarcomata I must agree with his conclusions that (1) from the local connection with the surrounding tissue we can never conclude that the tumor sprang from it; (2) from the behavior of the surrounding tissue we can conclude nothing as to the genesis of the existing tumor. This is especially clear from the beautiful specimens of Schultz-Zehden, which are one-celled and beautifully stained and permit of recognizing the tumor cells differentiated from the surrounding so plainly and sharply that they can easily be counted.

The idea first pronounced by Cohnheim, later on developed by Ribbert, that most tumors spring from misplaced tissue germs separate from the rest of the organism, must appear at least very probable to every one who has occasion to see these earliest stages of initial true tumors. If, however, with the microscope in these no transition forms from physiological to pathological cells can be found with certainty, how can we expect to find them in larger tumors which, as is universally agreed upon, grow out of themselves only; yet, large tumors are usually submitted to our microscopical examination. The explanation of the microscopic pictures thus found depends, I might say, on the taste of the examiner, that is, it is always subjective, never convincing, and objective.

After I had written this, a paper by B. Fischer on fundamental problems concerning tumors came into my hands. Regarding the value of microscopical studies for the histogenesis of tumors and other pathological processes, he says:

"By the anatomical (microscopical) method facts as to the genesis of tumors cannot be obtained." Further: "That the microscopical study, aside from its extraordinary advantage of viewing the undisturbed structure of the object, labors under the

great disadvantage that it gives only rigid momentary pictures of all these structures. The anatomical method cannot observe processes." "He calls the employment of microscopical studies as to histogenesis an overvaluation and faulty application which cannot be extirpated completely enough." Again: "The tumor cell is a cell by itself; it is biologically and qualitatively different from all normal cells at any stage of their development." * * *

* * * Taking into account the present opinion of tumor genesis of our most prominent pathologists like Albrecht, Beneke, Borst, Cohnheim, Fischer, Herxheimer, Lubarsch, Ribbert, Schwalbe, Ziegler, etc., who aside from more or less difference in detail agree in the one and most important point, that most true tumors spring from misplaced embryonic germs or cell groups which functionally have remained below the standard, and as Ribbert has taught, grow only out of themselves, we must consider the again and again repeated attempts in ophthalmologic literature to explain the choroidal sarcoma by a transformation of one or the other normal cells as without proof. It is astonishing that, as far as I can see, the ophthalmological tumor literature has hardly taken account any more of the experimental tumor study, than of the modern views concerning the tumor genesis. The aim of this paper is to recall these views to the memory of ophthalmologists. * * *

* * * In accord with Albrecht's opinion I believe it possible that a part of the sarcomata developing in the lower half of the choroid are due to disturbances in the closure of the choroidal cleft through the interposition and persistency of abnormal filling tissue. Tumors of the optic nerve might have the same genesis.

The cause for the growing into true tumors of the preformed embryonic tissue germs which may for a shorter or longer period, in most cases forever remain latent, is in general unknown. However, by Albrecht's views they are brought nearer an understanding, at least in certain cases. It can hardly be doubted that traumata and chronic inflammatory processes to which the eye is so often subjected without being followed by tumor formation, must in a whole series of cases be looked upon as the genetic causes of tumors. As difficult as it is to conceive how a contusion of the whole eyeball can induce a hitherto perfectly normal cell or cell group to change into a tumor cell and to proliferate to tumor formation, so probable does it appear to

me that the same trauma is occasionally the cause of tumor formation, if we assume in the eye a preformed embryonic tumor germ, hitherto latent, which is set to proliferating by the trauma to the whole eyeball and the resulting irritation. In the same manner it might be possible to explain the not infrequent tumor formation in eyes with iridocyclo-choroiditis. * * *

* * * In view of the total inadequacy of all attempts to explain the appearance of metastases 5, 10, 15, even 17 years after the radical removal of the primary tumor, it seems to me that from the Cohnheim-Ribbert-Albrecht standpoint we are justified in questioning again and again whether such late metastases are really such in the meaning of Virchow, or whether we may not have to deal with the growth of preëxisting tumor germs totally independent of the so-called primary tumor, the development into true tumors of which is only temporally very different from the first tumor.

The cause of this sudden and usually rapid growth of these latent tumor germs is at present as little known as that of the growth of the primary tumor. If we adopt Ehrlich's view, here again the changed nutritive conditions in the organism which produced the hypothetical growing material must play the chief rôle.

OPENING OF A NEW EYE HOSPITAL.

The Herman Knapp Memorial Eye Hospital has opened its doors in its new location, at the S. W. corner of 57th Street and Tenth Avenue, New York.

The hospital was founded in 1869 by the late Dr. Herman Knapp, and under the name of the "New York Ophthalmic and Aural Institute" it has been in uninterrupted activity at 44 and 46 East 12th Street. During these forty-four years over 420,000 patients have been treated. The new building is a specially constructed seven-story fire-proof hospital building, with complete modern equipment for the treatment and study of diseases of the eye.

The Board of Trustees has deemed the occasion of its removal to a new building in a new location the proper time to change the name of the Institute in honor of its distinguished founder.

ABSTRACTS FROM MEDICAL LITERATURE.

BY J. F. SHOEMAKER, M.D.,
ST. LOUIS, MO.

ARTIFICIAL ILLUMINATION A FACTOR IN OCULAR DISCOMFORT.

Nelson M. Black and F. A. Vaughn (*Jour. A. M. A.*, September 27, 1913, Part 2) discuss the cause of ocular discomfort from artificial illumination and say:

In conclusion it might be said that the eye at present, through the process of evolution, is adapted to solar light and can accommodate itself to marked variations in intensity of light of this character with less discomfort than with artificial illumination, because of the quality of the retinal stimulation. There is, however, no reason why ocular discomfort should be any more in evidence with the use of artificial illumination than with solar light, when due consideration is given to the various factors and important conditions bearing on its proper and intelligent application; for, as has also been pointed out, unintelligent and unscientific application of solar light to our every-day needs may and does produce even more harmful results than those often produced by artificial illumination. Beneficial results can certainly be obtained through thorough investigations of the effect of different wave lengths, and amounts of energy on the eye; the adjustment of the color of artificial illumination by selection and design of source; the modification of the effects by selection of color and characteristics of the surroundings; the change in color of reflected light by the color absorption characteristics of paper, ceiling and other surfaces, and the practical application of the ultrared and ultraviolet absorption characteristics of glass and other media. The ocular comfort of this and future generations depends on the solution by illuminating engineers of the problems of the proper application of artificial and natural illumination and it is gratifying to note the concordance of ideas and methods of application, and the unanimity of purpose, exemplified by the work of active members of this profession, in co-operation with physiologists, psychologists and ophthalmologists who are interesting themselves in this subject.

INTERSTITIAL KERATITIS (CONGENITAL
SYPHILITIC) TREATED BY SALVARSAN.

G. F. C. Wallis (*The Ophthalmoscope*, June, 1913) reports the results of ten cases of congenital interstitial keratitis treated with salvarsan. A positive Wassermann reaction was found in nine of the cases while in the tenth a positive Noguchi "Luetin" test was obtained. The injections were given intravenously and repeated as far as possible every ten days to two weeks until the required number had been given. In most of the cases, following the first injections, the same night or the next morning more often, there was some local reaction, with increased photophobia, lacrimation and in some cases pain. Generally after the third or fourth injection these symptoms did not occur. Little or no improvement follows the first one or two injections. In fact the condition may appear to be aggravated. However, after three or four doses the corneæ begin to clear, the pupils dilate more readily and the ciliary injection and photophobia to subside. In seven out of the ten cases the vision has been restored, varying between 6/24 up to 6/9 in from two to three months. In one case in which one eye was affected, after thorough treatment with salvarsan and after the eye had almost completely recovered, the second eye became involved, showing that salvarsan does not prevent the involvement of the unaffected eye in monocular cases. While in this respect the treatment is disappointing the author believes that salvarsan is of great benefit in a considerable number of cases, bringing about recovery in much less time than suffices with the old treatment by mercury and iodids. He uses the salvarsan in addition to the old treatment, local and constitutional, and not to supplant it.

HYDROPTHALMOS.

WITH A HISTOLOGICAL REPORT OF TWO CASES, ONE OF WHICH
PRESENTED A CONGENITAL COLOBOMA.

William Zentmayer (*Jour. A. M. A.*, September 27, 1913, Part 2), in the spring of 1912, saw three cases of this uncommon condition, all of which were in negro children. Having recollection of seeing but six cases of this disease in his experience, four of which were in negroes, two of these presenting marked evidences of hereditary syphilis, he decided to collate the opin-

iors of others as to the relationship of race and syphilis to the aetiology of the disease; also their experience in the treatment of the affection. The replies to questions on these points sent to a large number of ophthalmic surgeons apparently show that the negro race is not especially susceptible to the affection. If hereditary syphilis has any aetiological bearing on the production of the condition, the replies fail to show it. The fact that the negro race is not more susceptible than other races argues against this disease as a special factor.

An analysis of the replies showed that iridectomy gave fair results to 42 per cent., and poor results to 58 per cent. of the operators employing it. Sclerotomy gave fair results to 28 per cent. and poor results to 72 per cent. of the operators using it. Paracentesis of the anterior chamber with iridectomy gave unsatisfactory results to 100 per cent. of the operators using it. Sclerectomy gave satisfactory results to 40 per cent., encouraging to 20 per cent., and unsatisfactory to 40 per cent. of the operators using it. Miotic treatment was on the whole found to be unsatisfactory. The dangers and objections of iridectomy and sclerotomy, the two operations which have been longest employed, are discussed by the author and brief histories of two of his cases with the findings of anatomic studies and microscopic examinations are given. These, he says in conclusion, lend additional support to the view that the essential factor in the production of hydrophthalmos is an absence or incomplete development of the canal of Schlemm and that a probable contributing factor is the presence in the angle of the anterior chamber of prenatal connective tissue.

TEMPERATURE OF THE CONJUNCTIVA.

Lucien Howe (*Jour. A. M. A.*, September 27, 1913, Part 2) describes his method of taking the temperature of the conjunctiva and comparing it with that of the mouth, which is done with an arrangement he calls thermo-couples used in connection with a galvanometer. With this he can detect a difference of temperature of 0.03° C. or even 0.015° C. He raises the question, What do we learn from the use of these thermo-couples? and answers it as follows:

1. We know now for the first time that the temperature of the culdesac of the conjunctiva near the outer or inner canthus

is usually from about 0.3 to 0.04 degree C. lower than that of the mouth. This finding was at first rather surprising, and was naturally attributed to some fault in the instrument or in manipulation. Repeated trials, however, on different individuals seem to establish the fact beyond question. The reason of this is probably that the couple placed in the mouth rests against the tongue, and is protected by that on one side, and the thick layer of facial muscles on the other. On the other hand, the globe of the eye is protected only by the lids, much thinner of course than the cheek, and therefore not only colder, but more sensitive to variations of external temperature.

2. The temperature of the conjunctiva immediately over the cornea in six individuals was found to be on the average 0.1 degree C. lower than at the outer or inner canthus.

It will be observed that 36.9 C., or about 98.6 F., can be considered as the normal temperature. In several of the measurements the patients held in the mouth not only Couple B but also a Centigrade thermometer graduated in fifths of a degree, and accurately corrected by the Bureau of Standards. This gave the absolute temperature of the mouth, from which by comparison it was possible to obtain the absolute temperature of the conjunctiva. In these measurements also care was taken that no cold or warm fluids or food had been taken into the mouth for some time previously, as such substances affect the temperature for minutes or even for a few hours.

3. It is possible by this method to measure for the first time to what extent cold or hot applications to the outer portions of the lids really change the temperature of the conjunctiva. It was found, for example, in one case that when pieces of cotton moistened with ice-water were applied to the lids in rapid succession four or five minutes, the temperature of the conjunctiva could easily be reduced 1 or about 1.5 degree Centigrade.

On the other hand, the difficulty in reducing the temperature below that increased rapidly with each fraction of a degree.

This point is of importance in connection with the treatment of bacterial infections. It is well known that many of the forms which invade the conjunctiva have their vitality lessened in proportion to the decrease in temperature. Practically, however, it is difficult or impossible to produce such a change in the temperature as prevents the growth of these bacteria in the test-tube. This is a phase of the subject which seems worthy of much more careful study concerning each separate germ.

4. It is probable that the thermo-couples here described will prove of some value in at least two other directions. These are:

A. Indicating changes of temperature which accompany certain inflammatory conditions of the cornea, uvea or other portions of the globe itself.

B. Inasmuch as efforts of accommodation and convergence are often followed by slight injection of the conjunctiva, it is quite possible that with these two couples we may be able later to obtain a better idea of the metabolic changes which take place in that complicated process which we call eye-strain.

In a word, the field which thus opens before us for the first time seems to be one ripe and ready for a harvest of interesting facts by the ophthalmologists of the future.

TOPICAL DIAGNOSTIC VALUE OF THE HEMIOPIC PUPILLARY REACTION AND THE WILBRAND HEMIANOPTIC PRISM PHENOMENON.

WITH A NEW METHOD OF PERFORMING THE LATTER.

Clifford B. Walker (*Jour. A. M. A.*, September 27, 1913, Part 2) describes his methods of making these tests, summarizes the subject and offers the following conclusions:

I. HEMIOPIC CAPILLARY REACTION.

1. Nothing has been noted in these cases in disagreement with the theories of Heddaeus and Hess that the peripheral retina lacks pupillomotor sensitiveness.

2. The possibility of a hemiopic pupillary reaction within the pupillomotoric area is suggested.

3. In absolute central scotoma cases the absence of direct pupillary reaction without other cause than the scotoma speaks for the absolute central involvement of an area at least as large as the pupillomotor area, while the presence of direct pupillary reaction when the central scotoma is greater than the pupillomotor area as tested by large disks requires further tests for light-perception as described.

4. Observations may be complicated by "concentric movement" or other psychic reactions which may sometimes be eliminated by repetition.

5. Clinically the hemiopic pupillary reaction, in those chiasmal lesions of dyspituitary origin, or rather rapid onset and rapid re-

covery after operation, has failed, possibly due to a certain retention of pupillomotoric function, centrally, after vision for disks has been lost by the hemiopic retina.

II. THE WILBRAND HEMIANOPTIC PRISM PHENOMENON.

1. The peculiar distribution of field defects in anterior and posterior lesions often adds to and encourages psychologic factors which greatly complicate the Wilbrand test.

2. The presence of pseudorefixation, as demonstrated by the new method described, throws serious doubts on the presence of a definite reflex arc in the Wilbrand prism-phenomenon.

3. Clinically, the Wilbrand test has offered no valuable diagnostic data in these cases.

MASSACHUSETTS CHARITABLE EYE AND EAR INFIRMARY.

(233 Charles Street, Boston, Mass.)

Examinations for the appointment of House Officers on January 1, 1914, of one Aural and of one Ophthalmic House Officer will be held at this hospital on Thursday, December 11, 1913, at 10 a.m.

The service in the Aural Department is of eighteen months duration, with residence in the hospital.

The service in the Ophthalmic Department is of eighteen months duration, with residence in the hospital.

Applicants are examined in Anatomy, Physiology, Bacteriology, Pathology, Clinical Medicine and Therapeutics, and Surgery.

Application must be made before December 6, 1913. Application blanks can be obtained from the Superintendent at the hospital or will be sent by mail.

The number of patients treated in the wards last year was 3,652; 1,756 eye, 1,896 ear. The number of new out-patients was 30,012. The total out-patient attendance was 58,062. By these figures some idea can be obtained of the clinical opportunities offered.

FARRAR COBB, M.D., Superintendent,
233 Charles Street, Boston, Mass.

BOOK REVIEWS.

THE AMERICAN ENCYCLOPEDIA OF OPHTHALMOLOGY. Edited by Casey A. Wood, M.D., C.M., D.C.L., assisted by a large staff of collaborators. Fully illustrated. Volume II, B to Cataract, incipient. Chicago: Cleveland Press, 1913.

Like the first volume of this Encyclopedia, the second one is surprising by the vast amount of material collected under, one might say, one letter only, because words under B fill the largest part of it. The most important subjects have been given a space commensurate with their importance. Thus the excellent article on Bacteriology of the Eye by McKee with its illustrations comprises 94 pages, a book in itself. Blepharoplasty by Beard is another such article which is given sufficient space to make it as complete as possible. It is out of the question to refer even to all the most important articles; in fact it is hard to say what is the most important. One thing seems to be certain, that whatever subject is looked up will be found not only to have its place in this Encyclopedia, but to be handled in the best possible manner. Not the least interesting part are the biographical sketches by Shastid.

The editor and publisher are alike to be congratulated on the appearance of this volume, a number of misprints notwithstanding.

PRECIS D'OPHTHALMOLOGIE. (Textbook on Ophthalmology.) By Dr. V. Morax, Ophthalmologist of the Lariboisière Hospital. Second edition, with 427 figures and 4 colored plates. Paris: Masson & Cie., 1913.

This is one of the best textbooks on ophthalmology written in the French language. The present second edition by some additions is fully brought up to date. Its numerous illustrations are very practical and instructive.

GUIDE TO THE MICROSCOPIC EXAMINATION OF THE EYE. By R. Greef in collaboration with Stock & Wintersteiner. Translated from the third German Edition by Hugh Walker. London: The Ophthalmoscope Press.

Mr. Walker deserves great praise for his excellent translation into English of this very practical and useful book of Greef's. As it is, also, the only book on this subject in English it cannot fail to gain a wide field of usefulness. Every student and laboratory worker should possess it, if only for ready reference when in doubt about some point in his work. ALT.